

Exhibit M

(Part 1 of 2)



US005080367A

United States Patent [19]

Lynch et al.

[11] Patent Number: **5,080,367**
 [45] Date of Patent: **Jan. 14, 1992**

[54] GOLF BALL

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 [73] Assignee: Acushnet Company, New Bedford, Mass.
 [*] Notice: The portion of the term of this patent subsequent to Jun. 26, 2007.
 [21] Appl. No.: 543,968
 [22] Filed: Jun. 26, 1990

Related U.S. Application Data

[63] Continuation of Ser. No. 213,056, Dec. 4, 1980, Pat. No. 4,936,587, which is a continuation of Ser. No. 91,087, Nov. 5, 1979, abandoned, which is a continuation of Ser. No. 920,396, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 816,882, Jul. 18, 1977, abandoned, which is a continuation of Ser. No. 716,100, Aug. 20, 1976, abandoned, which is a continuation of Ser. No. 363,353, May 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 236,318, Mar. 20, 1972, abandoned.
 [51] Int. Cl. 5 A63B 37/14
 [52] U.S. Cl. 273/232; 273/218
 [58] Field of Search 273/232

[56] References Cited**U.S. PATENT DOCUMENTS**

D. 27,441 7/1897 Dunn D21/205
 D. 29,949 1/1899 Barnes D21/205
 D. 30,378 3/1899 Foulis D21/205
 D. 34,557 5/1901 Cooper D21/205
 D. 41,327 4/1911 Pearce D21/205
 (List continued on next page.)

FOREIGN PATENT DOCUMENTS

201159 3/1955 Australia 273/232
 1005479 2/1977 Canada 273/232
 12884 of 1914 United Kingdom 273/232
 1-06134 12/1916 United Kingdom 273/232
 377354 7/1932 United Kingdom 273/232
 757183 9/1956 United Kingdom 273/232

OTHER PUBLICATIONS

"The Curious History of the Golf Ball, Mankind's Most Fascinating Sphere", Horizon Press, New York, 1968, pp. 127-130.
 USGA, "The Rules of Golf", 1970, pp. 12-13.
 "Golf—Exercise of One's Brains", p. 208 (Japan).
 "A Guide to Golf Ball Engineering", pp. 772-773 (Japan).
 "An Evening Newspaper of the Mainichi" (Japan).
 "Iwanami's Dictionary of Mathematics", Feb. 20, 1971, pp. 581-582.
 "Manual of Mechanical Engineering", Sep. 15, 1970, pp. 2-18.
 "Encyclopedia of Science", Oct. 20, 1971, p. 168.

*Primary Examiner—George J. Mario
 Attorney, Agent, or Firm—Lucas & Just*

ABSTRACT

A finished, painted golf ball is disclosed. Dimples on the golf ball are interrelated by dimple number, dimple diameter and dimple depth and are arranged on the surface of the golf ball in a manner which enables the golf ball to travel further. At least about 80% of the distances between the closest points of the edges of adjacent dimples are less than about 0.065 inches and at least about 55% of the distances between the closest points of the edges of adjacent dimples are greater than about 0.001 inches.

Dimple number, dimple diameter and dimple depth are also interrelated in a specific manner according to the formula:

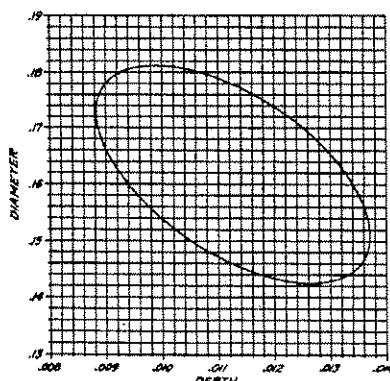
$$S = \left[\frac{831.5(d - x) - 55.56(D - y)}{a} \right]^2 + \left[\frac{83.15(D - y) + 555.6(d - x)}{b} \right]^2$$

wherein:

d=average depth of all dimples in inches
 D=average diameter of all dimples in inches
 S=computed unknown (1.0 or less for present invention)
 x, y, a and b are dependent on the number of dimples.

25 Claims, 13 Drawing Sheets

315 DIMPLES (FORMULA 1)



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U.S. PATENT DOCUMENTS

D. 41,698	8/1911	Royce	D21/205	D. 79,458	9/1929	Des Rosiers	D21/205
D. 41,817	10/1911	Pearce	D21/205	D. 80,740	3/1930	Perry	D21/205
D. 42,164	2/1912	Breakspear	D21/205	D. 91,919	4/1934	Burbank	D21/205
D. 43,673	3/1913	Johnston	D21/205	D. 94,403	1/1935	Burbank	D21/205
D. 44,109	5/1913	Penney	D21/205	D. 100,206	6/1936	Davis	D21/205
D. 44,175	6/1913	Martin et al.	D21/205	D. 102,940	1/1937	Cavignac	D21/205
D. 44,176	6/1913	Martin et al.	D21/205	D. 107,066	11/1937	Cavignac	D21/205
D. 44,177	6/1913	Martin et al.	D21/205	D. 108,065	1/1938	Cavignac	D21/205
D. 44,227	6/1913	Wood	D21/205	D. 176,470	12/1955	Martin	D21/205
D. 44,408	7/1913	Martin et al.	D21/205	D. 228,394	9/1973	Martin	273/232
D. 46,778	12/1914	Pearce	D21/205	697,417	4/1902	Kempshall	273/218
D. 46,783	12/1914	Worthington	D21/205	705,766	7/1902	Kempshall	273/220
D. 47,159	3/1915	Kempshall	D21/205	710,753	10/1902	Cavanagh	273/230
D. 49,905	11/1916	Martin	D21/204	716,945	12/1902	Selzer	273/230
D. 50,512	3/1917	Johnston	D21/205	878,254	2/1908	Taylor	273/232
D. 50,553	4/1917	Cochrane	D21/204	922,773	5/1909	Kempshall	273/232
D. 50,883	6/1917	Cochrane	D21/204	1,182,604	5/1916	Wadsworth	273/232
D. 51,722	2/1918	Eddy	D21/204	1,182,605	5/1916	Wadsworth	273/214
D. 52,500	9/1918	Vaiie	D21/205	1,265,036	5/1918	Bendelow	273/232
D. 52,706	11/1918	Robertson	D21/205	1,286,834	12/1918	Taylor	273/232
D. 52,712	11/1918	Turner	D21/205	1,418,220	5/1922	White	273/232
D. 55,330	5/1920	Robertson	D21/204	1,517,514	12/1924	Hunt	273/232
D. 59,366	10/1921	Martin	D21/204	1,656,408	1/1928	Young	273/232
D. 60,979	5/1922	Cigol	D21/204	1,666,699	12/1928	Hagen	273/232
D. 72,692	7/1927	Beldam	D21/204	1,681,167	8/1928	Beldam	273/232
D. 72,693	7/1927	Beldam	D21/204	1,716,435	6/1929	Fotheringham	273/232
D. 73,046	7/1927	Penfold	D21/204	1,855,448	4/1932	Hazeltine	273/232
D. 74,213	1/1928	Cigol	D21/204	1,862,708	6/1932	Rosenberg	273/213
D. 75,198	5/1928	Young	D21/205	2,002,726	5/1935	Young	273/232
D. 75,422	6/1928	Gioggia	D21/205	2,106,704	2/1938	Davis	273/232
D. 78,311	4/1929	Perry	D21/205	2,135,210	11/1938	Farrar	273/232
D. 79,223	8/1929	Binnie	D21/205	2,728,576	12/1955	Martin et al.	273/232
D. 79,224	8/1929	Binnie	D21/205	4,090,716	5/1978	Martin et al.	273/232
				4,936,587	6/1990	Des Lynch	273/232

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FIG. 1

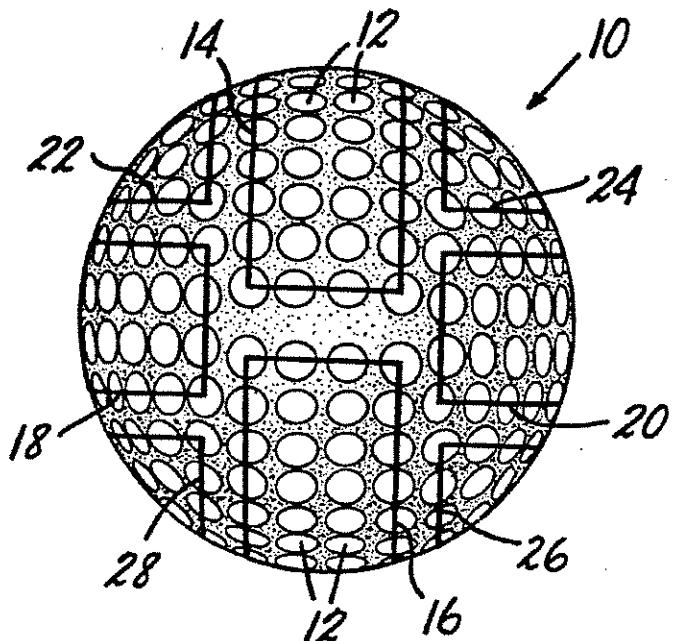
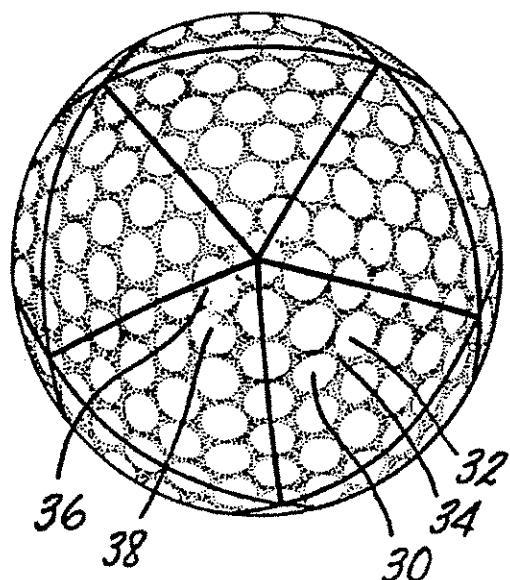


FIG. 2



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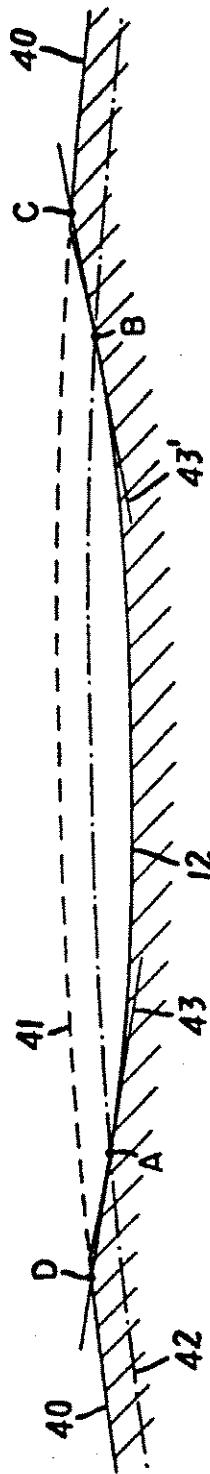


FIG. 3

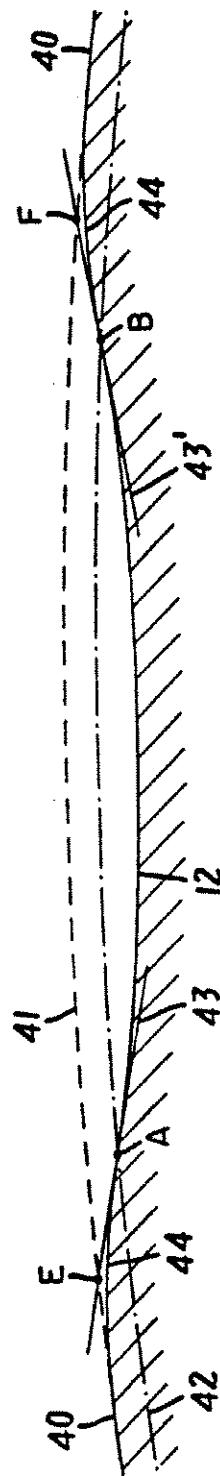


FIG. 4

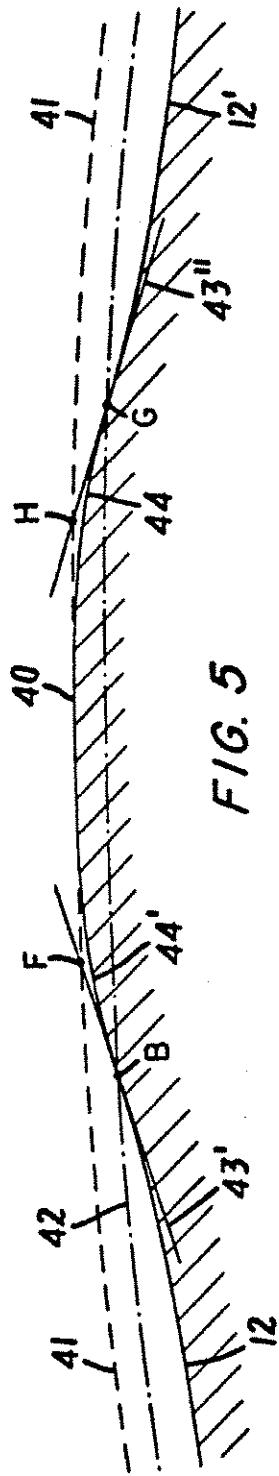


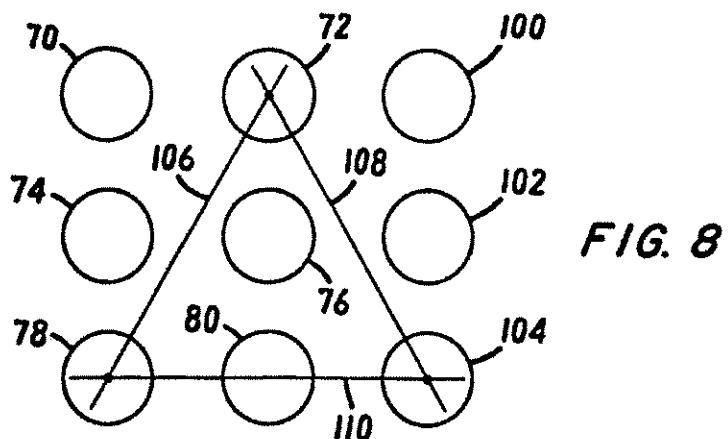
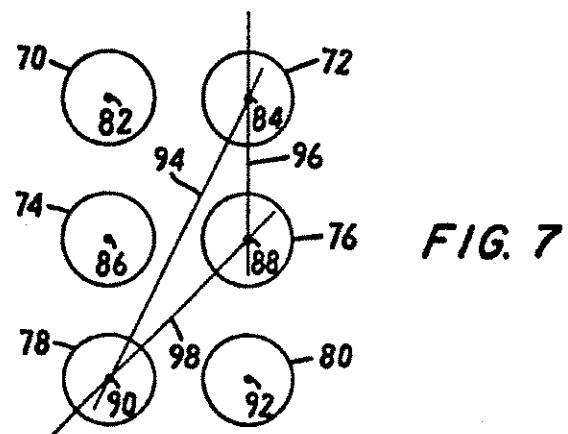
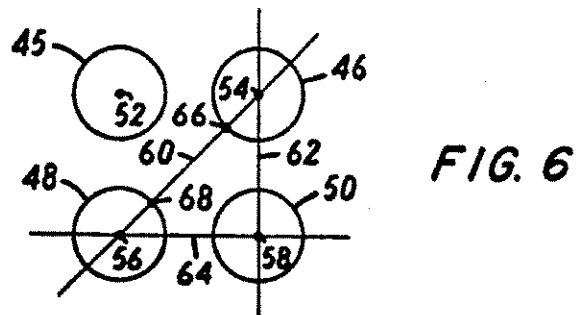
FIG. 5

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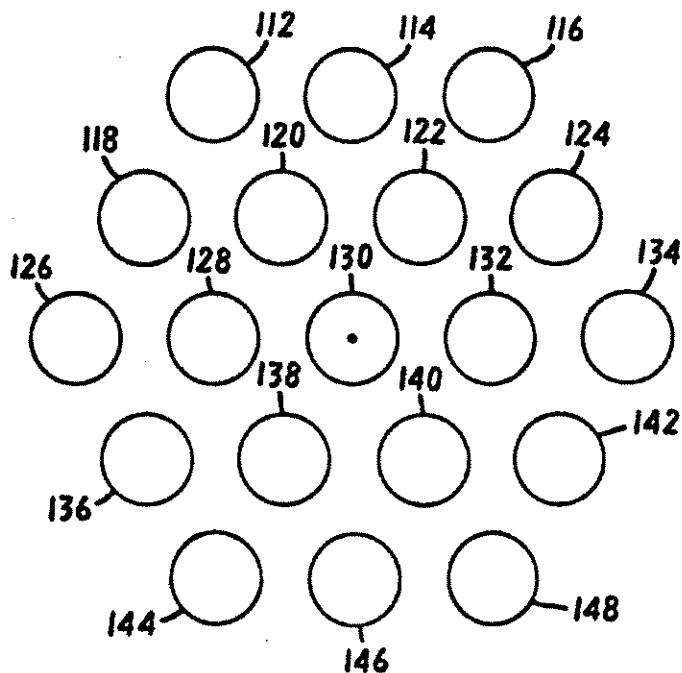


FIG. 9

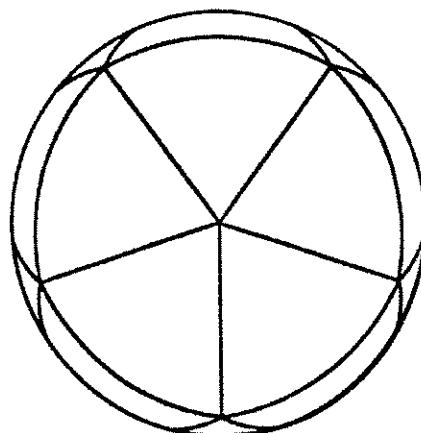


FIG. 10

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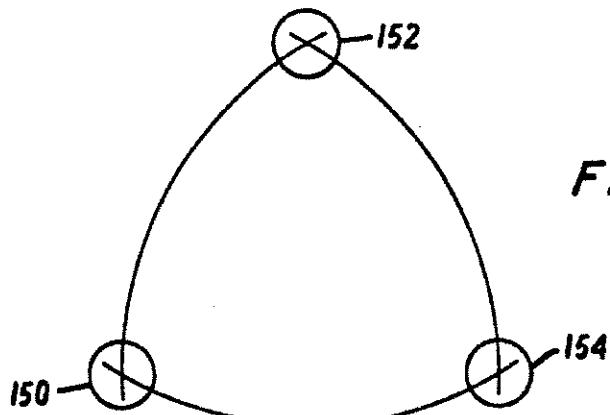


FIG. 11

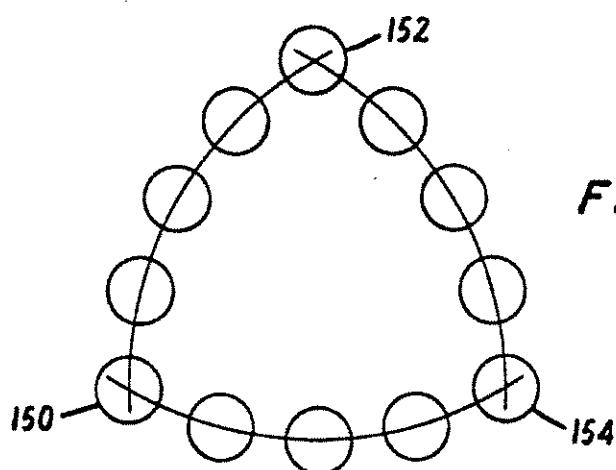


FIG. 12

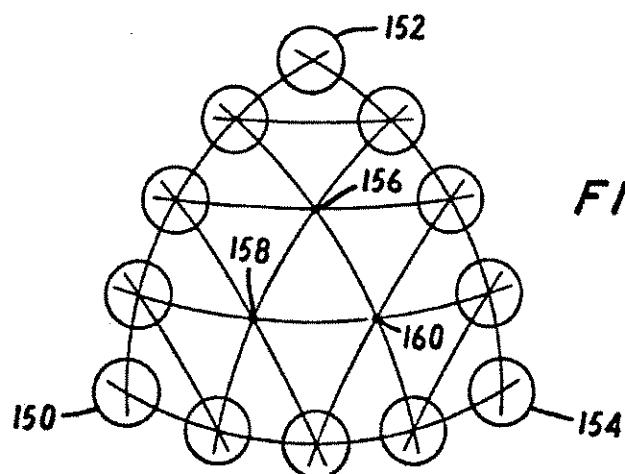


FIG. 13

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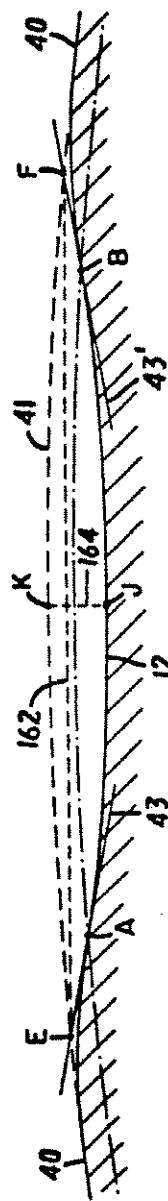


FIG. 14

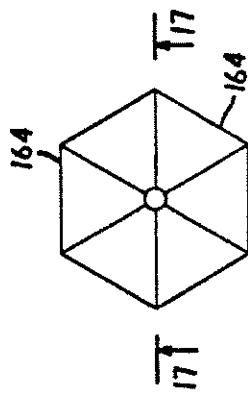


FIG. 15

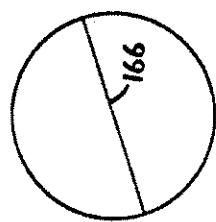


FIG. 16

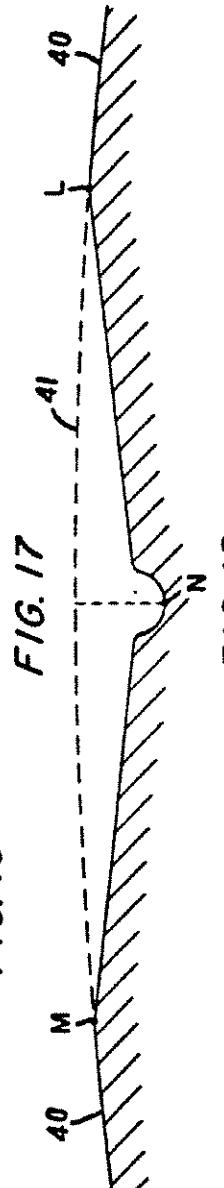


FIG. 17

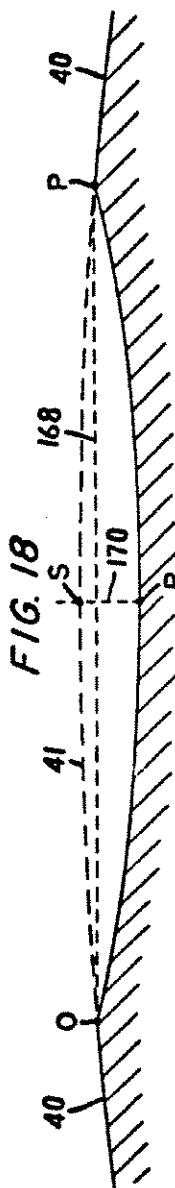


FIG. 18

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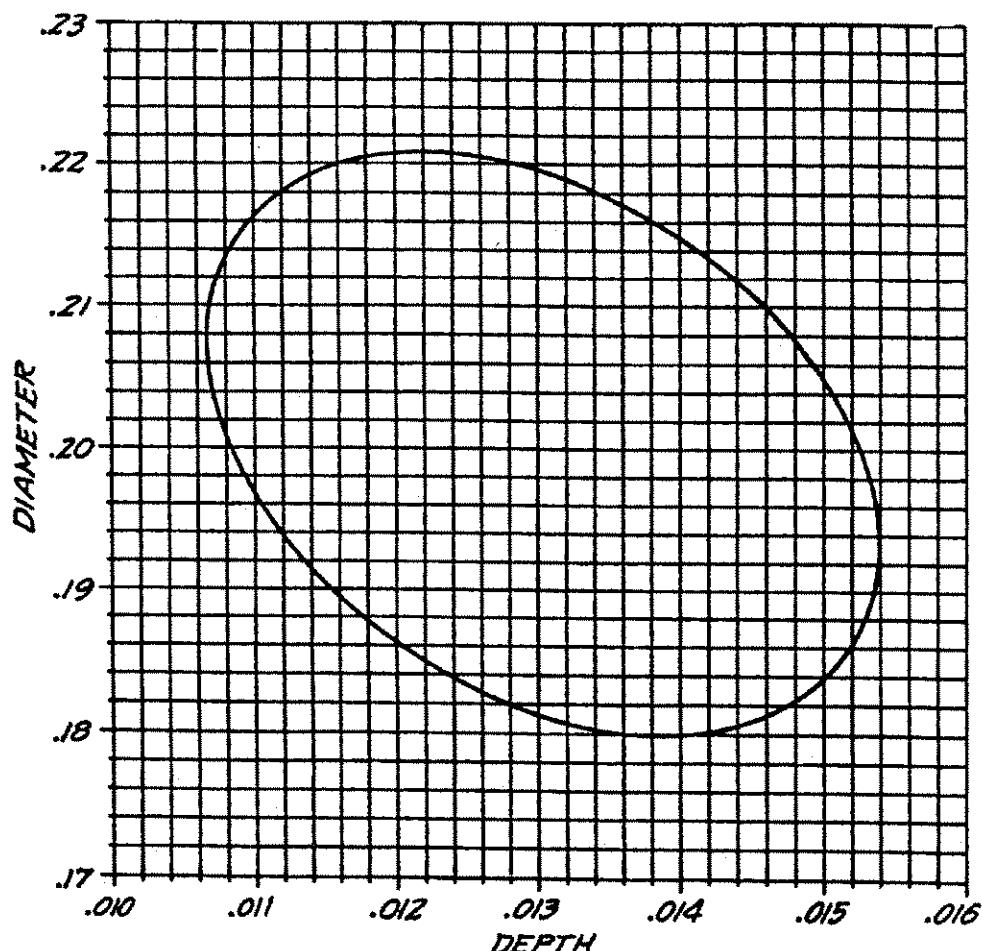
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FIG. 19.

182 DIMPLES (FORMULA 1)



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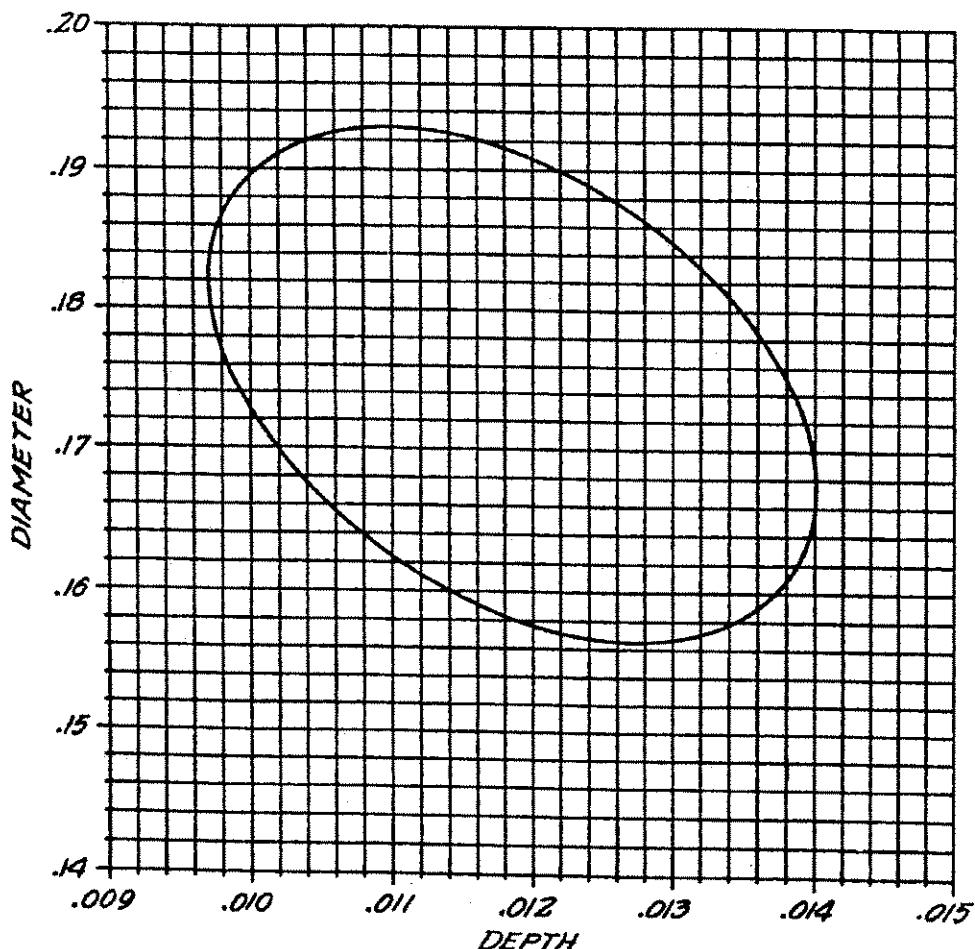
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FIG. 20.

252 DIMPLES (FORMULA 1)



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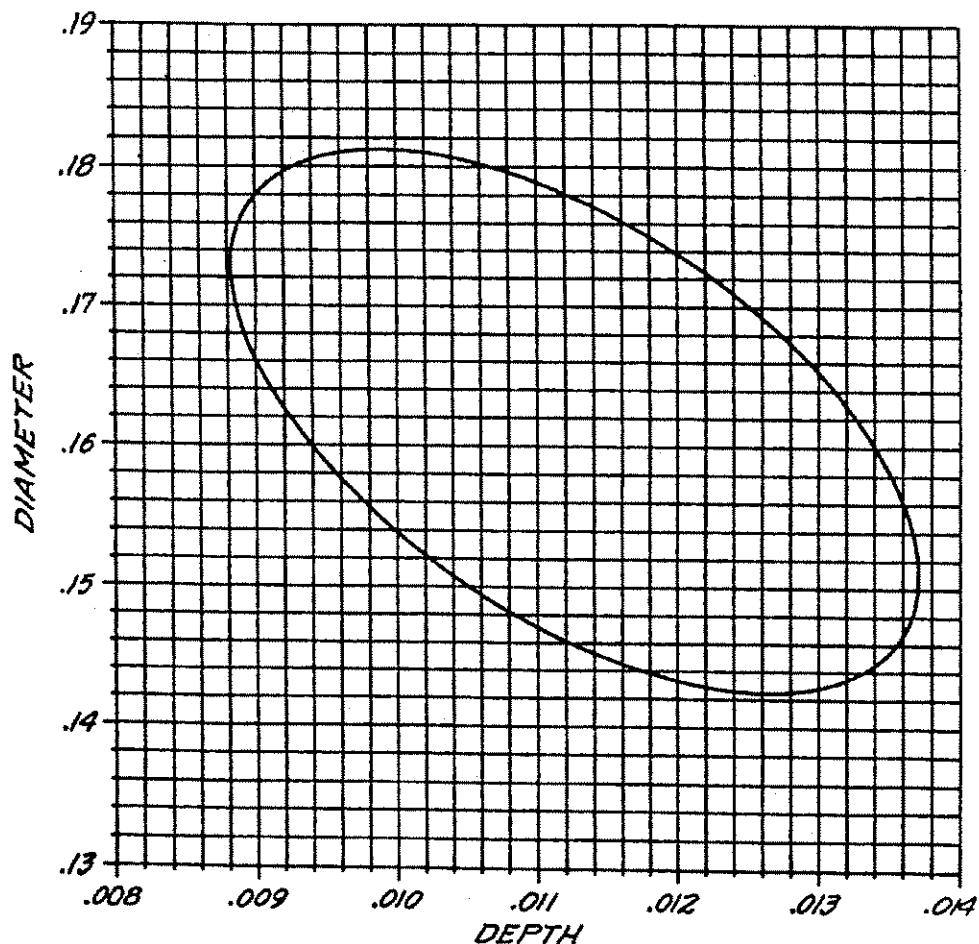
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FIG. 2I.

3/15 DIMPLES (FORMULA 1)



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FIG. 22.

332 DIMPLES (FORMULA 1)

